BY ORDER OF THE COMMANDER
AIR FORCE MATERIEL COMMAND

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AIR FORCE MATERIEL COMMAND
Supplement

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Logistics

PROPULSION LIFE CYCLE MANAGEMENT FOR AERIAL VEHICLES

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This publication implements AFMAN 20-116, *Propulsion Life Cycle Management for Aerial Vehicles*. AFMAN 20-116 is supplemented as follows: This supplement includes further defined roles and responsibilities within the AFMC logistics community. This supplement applies to all AFMC units possessing, storing, handling, maintaining, shipping, receiving, or managing inactive aerospace engines assigned to a Stock Record Account Number (SRAN). This publication applies to the Air Force Reserve (AFRC) and the Air National Guard (ANG). The annual engine retention computation computes a projected inventory need based on future aircraft flying hours, attrition factors, training aids, drone estimates and provisional forecasts. Inventories exceeding retention levels are evaluated for future reclamation/disposal and will be placed in long term storage, defined as: aerospace engines removed from active status and held in inactive status in anticipation of specific future requirements that may include parts reclamation, future Aerial Target Program [drones], awaiting disposal or support for the Security Assistance Program (SAP). Requirements of this publication must be implemented immediately and will be in compliance within 90 days of the date of publication unless otherwise noted within specific paragraphs. Units will contact the Office of Primary Responsibility (OPR) for interpretations of the guidance contained in this supplement. Waiver authority for this supplement is AFMC/A4US. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiers compliance items. Refer recommended changes and questions about this publication to the OPR

using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through the appropriate functional chain of command. Ensure that all records created as a result of processes prescribed in this publication are maintained IAW AFMAN 33-363, *Management of Records*, and disposed of IAW Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS). This publication may be supplemented at any level, but all supplements/operating instructions must be routed to the OPR of this publication for coordination prior to certification and approval. Send comments and suggestions for improvements to AFMC/A4US.

1.2.3.8. **(Added-AFMC)** Provide overall management, guidance, and direction for USAF aerospace engines in storage.

1.2.3.9. **(Added-AFMC)** Develop retention computation annually.

1.2.3.9.1. **(Added-AFMC)** Designate engines for retention as inactive status to meet requirements for potential recall to the active status, SAP, drones, future spare parts to support operational requirements, and other programs as required.

1.2.3.10. **(Added-AFMC)** Take responsibility for Aerospace Maintenance and Regeneration Group (AMARG) installed engines when aircraft held in storage codes XS or XT change Purpose Identifier code to XX or XV.

1.2.3.11. **(Added-AFMC)** Coordinate with storage location SRAN manager when changes occur to this chapter.

1.2.3.12. **(Added-AFMC)** Coordinate with the appropriate weapon system Aerospace Vehicle Distribution Office (AVDO) when an installed storage engine requires a different storage classification than the aircraft.

1.2.3.12.1. **(Added-AFMC)** Installed storage engine and aircraft classification code conflicts may require engine removal. Funding for the removal action will be dependent upon the future need of the engine.

1.2.3.12.1.1. **(Added-AFMC)** Whole engines retained for future reclamation will utilize the AMARG Form 44 process to request removal, storage device construction, and resealing engines to maintain a 2000 storage level of preservation. CSAG-S funding will only be used to support reclamation projects for budget code 8, AF managed repairable items. Customers planning to reclaim non-AF managed (non-budget code 8) items must provide AMARG the appropriate type of funding to support future reclamation activities.

1.2.3.12.1.2. **(Added-AFMC)** Whole engines retained for future reuse will utilize Depot Purchased Equipment Maintenance (DPEM) funding sourced from the appropriate weapon system office. Utilize the engine AMARG Asset Number (AN) to execute funding.

1.2.3.13. **(Added-AFMC)** Provide storage SRAN managers the following:

1.2.3.13.1. **(Added-AFMC)** The appropriate storage classification for engines upon transfer into long term storage, and anytime the storage classification changes.

1.2.3.13.2. **(Added-AFMC)** A workload agreement/statement of work covering those engines placed in storage.

1.2.3.13.3. **(Added-AFMC)** Disposition instructions on those engines no longer needed to support the AF mission, reclamation or foreign military sales.

1.2.4.4. **(Added-AFMC)** Additional responsibilities for Storage SRAN Engine Managers:

1.2.4.4.1. **(Added-AFMC)** Receipt and store engines per direction of appropriate engine program office.

1.2.4.4.2. **(Added-AFMC)** Take possession and be accountable for inventory reporting on engines within their possession.

1.2.4.4.3. **(Added-AFMC)** Transfer engines as disposition is provided. Disposal will be accomplished through Defense Logistics Agency Disposition Services (DLADS).

1.2.4.4.4. **(Added-AFMC)** Obtain a stamped turn-in document (DD Form 1348-1A) or Demilitarization (DEMIL) certification from DLA or contractor and forward copy of DD Form 1348-1 or DEMIL certification to AFLCMC/LPS and CEMS PMO. Report engines as a loss through the CEMS D042 database IAW TO 00-25-254-1.

4.9.1.1. **(Added-AFMC)** Approved retention computations will be used to develop future migration planning and provide supply chain management potential excess whole engines for parts reclamation.

4.9.1.2. **(Added-AFMC)** Results of annual retention computation are provided to the Source of Supply for reclamation determination. See AFMCI 23-111, Reclamation of AF Property, Chapter 8 for additional guidance on Aircraft Engine and Engine Parts Reclamation.

4.9.2. **(Added-AFMC)** Data required to complete the retention computation includes Propulsion Requirements System (PRS) computation results, actuarial Program Allocation (PA), Primary Aircraft Inventory (PAI), AMARG storage and CEMS inventory reports, see **Figure 4.5.** Engine Requirement Retention Computation.

Figure 4.5. (Added-AFMC) Engine Requirement Retention Computation

			ENGINE REQUIREMENTS RETENTION COMPUTATION													
	ENGINE MODEL,TYPE,SERIES		**AIRCRAFT MISSION, DESIGN, AND SERIES**						**FLYING HR PROG**		**DO41 CYCLE**		**DATE OF PROGRAM**			
	TF33/P-103		B52H						PA13PB		(enter D041 cycle here)		Jun-12			
		1 QTR	2 QTR	3 QTR	4 QTR	1 QTR	2 QTR	3 QTR	4 QTR	A QTR	A QTR	A QTR	A QTR	A QTR	A QTR
LINE	DESCRIPTION	FY: 13	FY: 13	FY: 13	FY: 13	FY:14	FY:14	FY:14	FY:14	FY:15	FY:16	FY:17	FY:18	FY:19	FY:20
1	TOTAL BASE & DEPOT STOCK RQMTS	26	10	10	10	10	10	10	10	10	10	10	10	10	10
2	TOTAL DEPOT REPAIR CYCLE RQMT	12	6	6	6	6	6	6	6	6	6	6	6	6	6
3	OBLIGATION - LOSS/OTHER 1 Cal-Gold Plate	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	TRAINING ENGINE REQUIREMENT 16 school, 1 training, 16 GITA engine (8 Minot/8 Barksdale)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	TOTAL OPERATIONAL RQMT W/O PROV ASSETS	33	33	33	33	33	33	33	33	33	33	33	33	33	33
6	PROVISIONAL ASSET RQMT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	TOTAL OPERATIONAL RQMT WITH PROV ASSETS	33	33	33	33	33	33	33	33	33	33	33	33	33	33
8	CURRENT PROJECTED INVENTORY 71 Spares, 16 school @ Sheppard (installed), 16 GITA (Minot/Barksdale), 1 training, 1 Cal-Gold Plate	105	104	104	104	104	104	104	104	104	104	104	104	104	104
9A	TOTAL OPERATIONAL RQMT WITH PROV ASSETS	33	33	33	33	33	33	33	33	33	33	33	33	33	33
9B	TOTAL OPERATIONAL INSTALLED ENGINES	608	608	608	608	608	608	608	608	608	608	608	608	608	608
9C	SPARE ENGINE FACTOR	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%
9D	STORAGE A/C INSTALLED RQMT (INSTALLS)	104	104	104	104	104	104	104	104	104	104	104	104	104	104
9E	**INACTIVE SPARE ENG RETENTION RQMT******	6	6	6	6	6	6	6	6	6	6	6	6	6	6
9F	**TOTAL RETENTION RQMT (Spares and Installs)**	110	110	110	110	110	110	110	110	110	110	110	110	110	110
10	**LONG SUPPLY**	**72**	71	71	71	71	71	71	71	71	71	71	71	71	71
11	**COMPUTED EXCESS**	**66**	65	65	65	65	65	65	65	65	65	65	65	65	65
12	CONTINGENCY RETENTION STOCK	25	25	25	25	25	25	25	25	25	25	25	25	25	25
13	**POTENTIAL DOD EXCESS (Used for RIAR)**	41	40	40	40	40	40	40	40	40	40	40	40	40	40
14	**EXCESS FOR DISPOSAL / RECLAMATION**	0/1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
REMARKS:															
Basic Comp: Line 8 Current Inventory=105) minus Line 7 (total operational requirements=33) = Line 10 (long supply= 72) Computed excess= 66															
Line 12: Retain 25 assets in-case of catastrophic event for whole engine replacement															
Line 14: Hold for future reclamation															
COMPUTED BY (NAME AND DATE)		PROGRAM MANAGER (NAME AND DATE)					ANALYZED BY (NAME AND DATE)					APPROVED BY (NAME AND DATE)			
Retention Computation Spreadsheet															

4.9.3. **(Added-AFMC)** Retention Computation Process:

4.9.3.1. **(Added-AFMC)** Line 1. Total Base & Depot Stock Requirements per PRS: Input the PRS Requirement; (PRS BSL negotiated; use highest requirement whether negotiated or computed and depot safety level).

4.9.3.2. **(Added-AFMC)** Line 2. Total Depot Repair Cycle Requirement: Input the total PRS depot pipeline requirement (use the highest requirement whether negotiated or computed).

4.9.3.3. **(Added-AFMC)** Line 3. Obligation – Loss/Other: Input all other requirements not addressed in PRS (example: bailment, loan, lease, calibration; do not include condemned on comp).

4.9.3.4. **(Added-AFMC)** Line 4. Training Engine Requirements: Input those training requirements coded as "S" in CEMS.

4.9.3.5. **(Added-AFMC)** Line 5. Total Operational Requirements without Provisional Assets: Input the sum of lines 1 – 4.

4.9.3.6. **(Added-AFMC)** Line 6. Provisional Asset Requirement: Input the difference from line-5 1st quarter total and greatest quantity on line-5 for the remaining quarters (quantity is to ensure future increases are accounted for before excessing for disposal).

4.9.3.7. **(Added-AFMC)** Line 7. Total Operational Requirement with Provisional: Input the sum of line 5 and 6.

4.9.3.8. **(Added-AFMC)** Line 8. Current Projected Inventory: Input the total number of on-hand spare engines as documented on the monthly inventory (includes training, calibrator, loan lease, bailment, and AMARG reclaimable other than inviolate in CEMS account codes A, G, C, F, N, R, S & Z only).

4.9.3.9. **(Added-AFMC)** Line 9A. Total Operational Requirements with Provisional Assets: Input line 7 quantity.

4.9.3.10. **(Added-AFMC)** Line 9B. Total Operational Installed Engines: Input the total engine inventory based on actuarial provided data showing PA and PAI aircraft authorized engine installs.

4.9.3.11. **(Added-AFMC)** Line 9C. Spare Engine Factor: Input the percentage after dividing line 9a by 9b. This factor reflects the percent of spare engines the USAF maintains per the PAI.

4.9.3.12. **(Added-AFMC)** Line 9D. Storage Aircraft Installed Requirement (installs): Input the quantity of engines installed on AMARG 1000 and 1500 stored aircraft.

4.9.3.13. **(Added-AFMC)** Line 9E. Inactive Spare Engine Retention Requirement: Input the results of line-9d multiplied by line-9c. This quantity represents the number of spare engines required to support inviolate aircraft maintained at AMARG.

4.9.3.14. **(Added-AFMC)** Line 9F. Total Retention Requirement (spares and installs): Input the sum of line-9d and 9e. This represents the required quantity of engines to be maintained to support inviolate AMARG aircraft.

4.9.3.15. **(Added-AFMC)** Line 10. Long Supply: Input the sum of line-8 subtracted by line-7. This quantity represents the long supply quantity before retention requirements are factored.

4.9.3.16. **(Added-AFMC)** Line 11. Computed Excess: Input based on, if line-9e is greater than line-10 enter "0", or if line-9e is less than line-10 enter the difference. This quantity represents the computed excess before program management evaluates results.

4.9.3.17. **(Added-AFMC)** Line 12. Contingency Retention Stock: Input the quantity program management determines required to support disaster relief, factor fluctuations, attrition and fluctuating demand.

4.9.3.18. **(Added-AFMC)** Line 13. Potential DOD Excess: Input the sum of line-11 subtracted by line-12.

4.9.3.19. **(Added-AFMC)** Line 14. Excess for Disposal/Reclamation: Input what portion of line 13 is for disposal and the other for reclamation.

4.9.3.20. **(Added-AFMC)** Remarks Section: Input program comments (if required).

4.9.3.21. **(Added-AFMC)** Signature Blocks: Signature are required by the initiator Engine Item Manager (EIM), EIM Lead, Program Manager, and both Section and Branch Chiefs.

Chapter10 (Added-AFMC)

ENGINE STORAGE

10.1. (Added-AFMC) General. This chapter provides additional guidance for managing inactive aerospace engines placed in storage and assigned to a SRAN designated as long term storage. The annual engine retention computation computes a projected inventory need based on future aircraft flying hours, attrition factors, training aids, drone estimates, and provisional forecasts. Inventories exceeding retention levels are evaluated for future reclamation/disposal and will be placed in long term storage, defined as: aerospace engines removed from active status and held in inactive status in anticipation of specific future requirements that may include parts reclamation, future Aerial Target Program [drones], awaiting disposal, or support for the SAP.

10.1.1. (**Added-AFMC**) All engines classified as stored assets will require a CEMS tracked special status code assigned per TO 00-25-254-1. Status code updates will be required as engine retention and aircraft migration changes occur. These codes are provided by the appropriate engine program office engine inventory manager.

10.2. (**Added-AFMC**) Financial accounts used to report uninstalled engine values:

10.2.1. (**Added-AFMC**) All engines will be Financial Improvement Audit Readiness (FIAR) reported within one of these account categories.

10.2.1.1. (**Added-AFMC**) Account 1511: Held for Use, used to record amounts for serviceable spare engines.

10.2.1.2. (**Added-AFMC**) Account 1512: Held in Reserve for Future Use, used to record amounts for unserviceable repairable spare engine.

10.2.1.3. (**Added-AFMC**) Account 1513: Excess, Obsolete, and Unserviceable, used to record amounts that are not reportable in accounts 1511, 1512, or 1514. Includes awaiting disposal, parts reclamation, awaiting FMS, Propulsion Materiel Exchange Program candidate, and/or any other scenario where the engine is not intended for reuse as a whole engine, (possible ground training assets).

10.2.1.4. (**Added-AFMC**) Account 1514: Held for repair, used to record amounts for remanufacturing.

10.2.2. (**Added-AFMC**) Installed storage engines are reported financially as part of the aircraft by the weapon system program managers.

10.2.2.1. (**Added-AFMC**) To prevent duplicate counting of removed engines from active aircraft, the CEMS database will be used to determine the number of obligations (aircraft holes for missing engines), and deduct those obligation quantities against the appropriate TMS overall serviceable quantity. The final results will be used to report the overall 1511 account quantity.

10.2.3. (**Added-AFMC**) Uninstalled Engine Storage Classification Codes:

Note: Uninstalled engines shipped to a storage facility for 1000/1500 type storage will be preserved and documented IAW TO 2J-1-18, *Preparation for Shipment and Storage of Gas*

Turbine Engines. 2000 type will be drained and purged prior to shipment, and preserved if possible to retain potential reclamation assets.

10.2.3.1. (**Added-AFMC**) Uninstalled engines stored in Code 1000:

10.2.3.1.1. (**Added-AFMC**) Engine being maintained for whole engine reuse and requires preventive maintenance to ensure system integrity. The storage site will re-preserve engines IAW timelines outlined in TO 2J-1-18. Storage sites will contact the appropriate engine program office if no preservation capability exists.

10.2.3.1.2. (**Added-AFMC**) FIAR reportable in account 1511.

10.2.3.1.3. (**Added-AFMC**) CEMS special status code S10/D10 will be assigned (includes engines with transaction condition 8Z).

10.2.3.2. (**Added-AFMC**) Uninstalled engines stored in Code 1500:

10.2.3.2.1. (**Added-AFMC**) Engine being maintained for future reuse, reclamation, or SAP support. Engine does not require re-preservation however; all openings, to include the outer portions of the engine will require sealing to prevent dust, dirt, or other foreign objects from entering or accumulating on the engine and its components.

10.2.3.2.2. (**Added-AFMC**) FIAR reportable in account 1512.

10.2.3.2.3. (**Added-AFMC**) CEMS special status code S15/D15 will be assigned (includes engines with transaction condition 8Z).

10.2.3.3. (**Added-AFMC**) Uninstalled engines stored in Code 2000:

10.2.3.3.1. (**Added-AFMC**) Engine being maintained for reclamation and will require sealing protection from the environments similar to Code 1500.

10.2.3.3.2. (**Added-AFMC**) FIAR reportable in account 1513.

10.2.3.3.3. (**Added-AFMC**) CEMS special status code S20/D20 will be assigned (includes engines with transaction condition 8Z and all engines in ownership account code S).

10.2.3.4. (**Added-AFMC**) Uninstalled engines stored in Code 4000:

10.2.3.4.1. (**Added-AFMC**) Engines identified as excess inventory by the appropriate engine program office. There are no special requirements to protect these engines from foreign objects. These engines are coded as such until physically disposed of.

Note: Uninstalled engines will not be shipped to storage facilities for 4000 type storage, but reclaimed locally if feasible and disposed of by local DLA-DS organization.

10.2.3.4.2. (**Added-AFMC**) FIAR reportable in account 1513.

10.2.3.4.3. (**Added-AFMC**) CEMS special status code S40/S45/D40/D45 will be assigned (includes engines with transaction condition 8Z and all engines in ownership account code S).

Chapter 11 (Added-AFMC)

ENGINE TRANSER TO/FROM USAF INVENTORY

11.1. (Added-AFMC) General. This chapter provides guidance on the CEMS documentation when transferring aerospace engines in and out of USAF inventory from other services, National Museum of the USAF (NMUSAF), or to the SAP.

11.1.1. (**Added-AFMC**) Transfers to/from SAP and other Services.

11.1.1.1. (**Added-AFMC**) All installed/uninstalled engine transfers will follow documentation guidance per TO 00-25-254-1. This requirement applies to gains and losses.

11.1.1.2. (**Added-AFMC**) All loss transfers will be approved by the appropriate engine program office based on latest retention computation results.

11.1.1.2.1. (**Added-AFMC**) Uninstalled engine transfers will be classified as excess property by the appropriate engine program division.

11.1.1.3. (**Added-AFMC**) Installed engine transfer approval will follow aircraft guidance AFI 16-402, *Aerospace Vehicle Programming, Assignment, Distribution, Accounting, and Termination.*

11.1.1.4. (**Added-AFMC**) Transfers of uninstalled engines to foreign customers require the appropriate coordination transfer through SAP or IEMP.

11.1.1.5. (**Added-AFMC**) All funding to prepare and transfer assets reside with the gaining organization/country worked through the appropriate country case manager.

11.1.1.6. (**Added-AFMC**) SRAN managers losing engines will take the loss action in CEMS once received by gaining agency and any gain action upon physical possession of engine IAW guidance outlined in TO 00-25-254-1.

11.1.2. (**Added-AFMC**) Transfer to the NMUSAF.

11.1.2.1. (**Added-AFMC**) All installed/uninstalled engines being transferred to the NMUSAF or NMUSAF approved recipient require approval from the appropriate engine program office prior to transfer. Once the Program Office approves the transfer the following actions will take place:

11.1.2.2. (**Added-AFMC**) The losing SRAN managers will take the loss transaction in CEMS.

11.1.2.3. (**Added-AFMC**) The NMUSAF will follow AFI 84-103, *U.S. Air Force Heritage Program* and the following guidance when transferring aerospace engines to a historical artifact account:

11.1.2.3.1. (**Added-AFMC**) Installed engines are accessioned as part of the aerospace vehicle and therefore are not required to be accessioned as a separate historical artifact.

11.1.2.3.2. (**Added-AFMC**) Uninstalled engines not obligated to an aerospace vehicle will be accessioned as a separate historical artifact.

11.1.2.4. (**Added-AFMC**) Funding for engine shipment will follow guidance in AFI 84-103.

Chapter 12 (Added-AFMC)

ENGINE MIGRATION PLANNING

12.1. (Added-AFMC) General. Migration planning is an integral part of life cycle planning as an element of inventory management and is developed through coordination of the EIM and PM to identify current and programmed force structure throughout the FYDP.

12.1.1. (**Added-AFMC**) At a minimum, plans will address requirements for engines forecasted for retirement and those in long-term storage.

12.1.2. (**Added-AFMC**) Copies of the migration plan will be provided to AMARG as part of the program WLA/SOW and updated annually.

12.1.3. (**Added-AFMC**) Plans are developed from the annual Retention Computation process and account for active and inactive requirement.

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Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 16-402, *Aerospace Vehicle Programming, Assignment, Distribution, Accounting, and Termination,* 30 May 2013

AFMAN 20-116, *Propulsion Life Cycle Management for Aerial Vehicles*, 7 February 2014

AFH 23-123V2PT1, *Material Management Operations*, 8 August 2013

AFMAN 33-363, *Management of Records*, 1 March 2008

AFI 84-103, *U.S. Air Force Heritage Program*, 27 October 2004

TO 2J-1-18, *Preparation for Shipment and Storage of Gas Turbine Engines,* 1 September 2010

Prescribed Forms

None

Adopted Form

AF Form 847, *Recommendation for Change of Publication*

AFTO FORM 44, *Turbine Wheel Historical Record*

Abbreviations and Acronyms

DEMIL—Demilitarization

EIM—Engine Item Manager

PA—Program Allocation

PAI—Primary Aircraft Inventory